Kinetic consideration of some...

where Q denotes the radial particle flux, and P is the generalized momentum: $Q = enrv_r = \text{const}$; $P = r(Mv_\varphi + eA_\varphi/c) = \text{const}$. In dimensionless parameters ($a = eA_\varphi/Mcv_0$, $p = P/Mv_0$) one obtains

$$\frac{d}{dr}\left(\frac{1}{r}\frac{dra}{dr}\right) = -\frac{4\pi eQ}{Mc^2v_0}\frac{p/r-a}{r\sqrt{1-(p/r-a)^2}}. \qquad (35)$$

and, with $N = \int n2\pi rdr$

$$N = \frac{2\pi Q}{cv_0}\int_{r_1}^{r_2}\frac{dr}{\sqrt{1-(p/r-a)^2}}. \qquad (36)$$

In zeroth approximation $\omega = e^2H_0N/2\pi^2Mc$, and

$$H = H_0\left\{1-\frac{2e^2N}{\pi Mc^2}\arccos\frac{r_1r_2/r+r}{r_1+r_2}\right\}, \quad r_1 \leqslant r \leqslant r_2. \qquad (37)$$

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Kinetic consideration of some...

results for the field. A two-component system is finally dealt with briefly, and the normal drop of monoenergetic ion- and electron beams on a magnetic field is considered; ion and electron velocities to infinity are taken to be equal to v_{oi} and v_{oe}, $v_{oi} \neq v_{oe}$. Equation (5) is then rendered into

$$f_i = 2v_{0i}n_0\delta\,(v^2 + 2e\Phi/M - v_{0i}^2)\,\delta(v_y + eA/Mc)\,\delta(v_z).$$
$$f_e = 2v_{0e}n_0\delta\,(v^2 - 2e\Phi/m - v_{0e}^2)\,\delta(v_y - eA/mc)\,\delta(v_z) \qquad (44)$$

where, within the range of the joint particle motion,

$$d^2\psi/d\xi^2 = (c^2/v_{0e}^2)\,[(1 + \psi - a^2)^{-1/2} - (1 - \theta\psi - \mu\theta a^2)^{-1/2}],$$
$$d^2a/d\xi^2 = a[(1 + \psi - a^2)^{-1/2} - \sqrt{\mu\theta}\,(1 - \theta\psi - \mu\theta a^2)^{-1/2}]. \qquad (45)$$

is valid, where

$$eA/mv_{0e}c = a, \quad 2e\Phi/mv_{0e}^2 = \psi, \quad \xi^2 = x^2 4\pi e^2 n_0/mc^2, \quad \mu = m/M, \quad \theta = mv_{0e}^2/Mv_{0i}^2. \qquad A$$

Card 8/10

24705
S/056/61/040/005/005/019
B102/B201

Kinetic consideration of some...

For a nonrelativistic plasma ($c^2/v_{oe}^2 \gg 1$), $\psi = (1-\mu\theta)a^2/(1+\theta)$ is found, and further,

$$d^2a_1/d\xi_1^2 = a_1/\sqrt{1-a_1^2}, \tag{48}$$

$$a_1 = a\,[(1+\mu)\theta/(1+\theta)]^{1/4}, \quad \xi_1 = \xi\,[1+\sqrt{\mu\theta}]^{1/4}. \tag{49}$$

The thickness of the transition layer is thus found to be $\delta \sim (mc/4\pi e^2 n_o)\left[1+\sqrt{\mu\theta}\right]^{1/2}$. There are 8 figures and 6 references: 4 Soviet-bloc and 2 non-Soviet-bloc. The reference to the English-language publication reads as follows: L. Tonks. Phys. Rev. 118, 2, 1960.

SUBMITTED: August 3, 1960

Card 9/10

GINEVSKIY, A.S.; MOROZOV, A.I.

Effect of the radial and circumferential irregularity of the flow on characteristics of stages of an axial-flow compressor. Prom.-aerodin. no.24:63-73 '62. (MIRA 16:7)
(Compressors—Aerodynamics)

S/057/62/032/007/012/013
B104/B102

AUTHORS: Zuyeva, N. M., Morozov, A. I., and Solov'yev, L. S.

TITLE: Existence of magnetic surfaces of a periodic magnetic field having large longitudinal components, accurate to terms of the 4th order

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 32, no. 7, 1962, 897-899

TEXT: Magnetic surfaces are shown to exist, in fourth approximation, in the general case of a periodic field which has large longitudinal component $H_{\parallel}$. Magnetic surfaces not found by numerical methods either occur in higher approximation, or their effects are exponentially small. The equations averaged according to N. N. Bogolyubov for the lines of force of a magnetic field have unique integrals when terms of the order $(H_{\perp}/H_{\parallel})^4$ are taken into account.

SUBMITTED: March 5, 1962

Card 1/1

MOROZOV, A.I.

1

AUTHORS: Golubkina, I. M., Corresponding Member AS [illegible], Trubnikov, B. I., Zoyeva, N. M., Nikolayeva, M. S., and Morozov, A. I.

TITLE: Example of a toroidal magnetic field having nonmagnetic surfaces

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 143, no. 1, [illegible]

TEXT: The existence of magnetic surfaces can be proved only if the equations derived only if the relevant magnetic field has [illegible]. In unsymmetric magnetic fields, the equations of these surfaces can only be approximated. An unsymmetric magnetic field with the scalar potential

$$\Psi = z + h_3 I_1(kr)\sin k(\varphi - z) + h_0 I_0(kr)\cos kz$$

has been calculated numerically in a previous study ([illegible], 71, no. 1, (1961)). The magnetic surfaces of such a field were shown to degenerate at $h_3 = 3$, $h_0 = 0.125$. In the present study, this phenomenon is investigated in detail. The course of the lines of force is calculated

Card 1/2

Example of a toroidal magnetic ... [illegible]

and it is shown that the lines of force which [illegible] surfaces do not lie on a closed curve. [illegible] exists in this case. There are 3 figures and [illegible] references [illegible] 1 non-Soviet. The reference to the English-language [illegible] follows: M. Spitzer, Proc. of the II. Geneva Conference on [illegible] Uses of Atomic Energy, 1958.

• SUBMITTED: December 11, 1961

Card 2/2

MORCZOV, A.I.; SOLOV'YEV, L.S.

Geometry of the magnetic field. Vop. teor. plaz. no.2:3-91 '63.

Motion of charged particles in electromagnetic fields. Ibid.:177-261
(MIRA 17:2)

MOROZOV, A.I.; SOLOV'YEV, L.S.

Typical structure of a toroidal magnetic field. Zhur. eksp. i teor. fiz. 45 no.4:955-959 O '63. (MIRA 16:11)

S/020/63/148/006/009/023
B112/B186

AUTHORS: Gel'fand, I. M., Corresponding Member AS USSR, Grayev, M. I., Zuyeva, N. M., Mikhaylova, M. S., Morozov, A. I.

TITLE: The structure of a magnetic toroidal field having no magnetic surfaces

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 148, no. 6, 1963, 1286-1289

TEXT: A large number of force lines of the field

$$\psi_3 + \psi_0 = H_0 z + h_3 I_3(3r)\sin 3(\zeta - z) + h_0 I_0(3r)\sin 3z$$

have been calculated numerically for $H_0 = 1$, $h_3 = 3$, $h_0 = 0.120$, 0.125, 0.130. From their plots a series of qualitative and quantitative properties of fields with collapsing magnetic surfaces are derived. There are 3 figures.

SUBMITTED: October 30, 1962

Card 1/1

S/020/63/149/003/008/028
B112/B180

AUTHORS: Morozov, A. I., Solov'yev, L. S.

TITLE: Symmetric magnetohydrodynamic flows

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 149, no. 3, 1963, 550 - 553

TEXT: For the stream functions ψ_0, ψ, I_0, I which are defined by

$$r\begin{pmatrix} v_r \\ H_r \end{pmatrix} = \begin{pmatrix} \frac{1}{\rho}\frac{\partial\psi_0}{\partial\theta} \\ \frac{\partial\psi}{\partial\theta} \end{pmatrix}, \quad \alpha r\begin{pmatrix} v_\theta \\ H_\theta \end{pmatrix} = \begin{pmatrix} v_\theta \\ H_\theta \end{pmatrix} = \begin{pmatrix} \frac{1}{\rho}\frac{\partial\psi_0}{\partial r} \\ \frac{\partial\psi}{\partial r} \end{pmatrix}, \tag{6}$$

$$r\begin{pmatrix} I_\varphi \\ I_r \end{pmatrix} = \begin{pmatrix} \frac{\partial I_0}{\partial\theta} \\ \frac{\partial I}{\partial\theta} \end{pmatrix}, \quad \alpha r\begin{pmatrix} I_{0\theta} \\ I_\theta \end{pmatrix} = \begin{pmatrix} I_{0\varphi} \\ I_\varphi \end{pmatrix} = \begin{pmatrix} \frac{\partial I_0}{\partial r} \\ \frac{\partial I}{\partial r} \end{pmatrix},$$

the system of equations

Card 1/3

Symmetric magnetohydrodynamic flows

$$\frac{s}{\rho}\Delta^*\xi+\frac{1}{2\beta\rho}\frac{\partial s}{\partial\xi}(\nabla\xi)^2-\frac{\psi_0'^2}{\beta\rho^2}(\nabla\rho\nabla\xi)+\frac{1}{2\beta\rho}\frac{\partial}{\partial\xi}\frac{A^2}{s}+ \tag{10}$$
$$+\frac{\beta'}{2}\frac{\partial}{\partial\xi}\frac{B^2}{s}+\frac{\partial}{\partial\xi}\frac{AB\psi_0'}{\rho s\psi'}-\frac{2\alpha A}{\beta^2\rho}-U'=0;$$

$$W+\frac{v^2}{2}+\Phi+\frac{\beta B^2}{s}+\frac{AB\psi_0'}{\rho s\psi'}=U,\quad s\equiv\frac{\psi_0'^2}{\rho}-\psi'^2; \tag{11}$$

$$r\begin{pmatrix}v_r\\H_r\end{pmatrix}=\begin{pmatrix}\psi_0'/\rho\\\psi'\end{pmatrix}\frac{\partial\xi}{\partial\theta},\quad\alpha r\begin{pmatrix}v_z\\H_z\end{pmatrix}-\begin{pmatrix}v_\varphi\\H_\varphi\end{pmatrix}=\begin{pmatrix}\psi_0'/\rho\\\psi'\end{pmatrix}\frac{\partial\xi}{\partial r},$$
$$\begin{pmatrix}v_\varphi\\H_\varphi\end{pmatrix}+\alpha r\begin{pmatrix}v_z\\H_z\end{pmatrix}=\frac{A}{s}\begin{pmatrix}\psi_0'/\rho\\\psi'\end{pmatrix}+\frac{\beta B}{s}\begin{pmatrix}\psi'\\\psi_0'\end{pmatrix}, \tag{12}$$

where $\Delta^*=\frac{1}{r}\frac{\partial}{\partial r}\frac{r}{\beta}\frac{\partial}{\partial r}+\frac{1}{r^2}\frac{\partial^2}{\partial\theta^2}$, is derived. The equations (10) - (12) describe the stationary flow of an ideal conductive compressible fluid in a magnetic field with helical symmetry. A and B are arbitrary functions of ξ. Examples of plane and axially symmetric flows are considered.

PRESENTED: October 27, 1962, by M. A. Leontovich, Academician

S/020/63/149/003/008/028
B112/B180

Symmetric magnetohydrodynamic flows

SUBMITTED: October 11, 1962

Card 3/3

ZUYEVA, N.M.; MIKHAYLOVA, M.S.; MOROZOV, A.I.

Example of the structure of a magnetic field with disintegrating magnetic surfaces. Dokl. AN SSSR 153 no.4:801-803 D '63. (MIRA 17:1)

1. Predstavleno akademikom M.A. Leontovichem.

L 41509-65 EWT(1)/EWP(m)/EWA(d)/FCS(k)/EWA(1) Pd-1
ACCESSION NR: AP4044518 S/0294/64/002/004/0525/0534

AUTHORS: Artyushkov, Ye. V. (Moscow); Morozov, A. I. (Moscow)

TITLE: On the longitudinal instability in one-dimensional conducting gas flow

SOURCE: Teplofizika vysokikh temperatur, v. 2, no. 4, 1964, 525-534

TOPIC TAGS: compressible flow, magnetic field, fully ionized plasma, longitudinal instability, isothermal flow, adiabatic gas flow, thermal diffusion, heat convection, acoustic vibration, hydrodynamic equation

ABSTRACT: The stability of longitudinal oscillations in compressible, electrically conducting gas under a transverse magnetic field was studied analytically. The flow is assumed to be inviscid and in a channel slowly varying in cross section. Furthermore, the gas is assumed to have finite electric and thermal conductivities. The analysis is carried out by means of expansions in the small parameter λ/L where λ = oscillation wavelength, L = length of channel. The hydrodynamic equations are written for a fully ionized gas with $T_i = T_e$, ohmic and viscous dissipations are neglected and the equations are then nondimensionalized by means of the parameters

$$\frac{x}{L} = \xi, \quad \frac{tc_*}{L} = \tau, \quad \frac{v_0}{c_*} = V,$$

Card 1/3

where c_{*} - flow velocity in critical section. The oscillations in the various parameters in the channel are described by functions of the form $F = F(\xi)\exp(i\beta T)$ where $\beta = \omega L/c_{*}$. Two limiting cases are considered only: 1) diffusion terms much higher than convection terms in the energy equation and $H_1/H_0 \sim 1/\beta$, $\beta \gg 1$ (H - magnetic field); 2) the amplitude of hydrodynamic pressure oscillations much larger than the amplitude of magnetic pressure oscillations. These two cases are studied under the assumption of quasi-isothermal and quasi-adiabatic oscillations. In the former, $T_1/T_0 \sim 1/i\beta$ and solutions are obtained for $V = 0$ and $V_0 \gg c_T$ ($c_T^2 = \gamma RT_0/M$) up to order $1/i\beta$ in the expansion. The instability condition appears under $c_A \gg c_T$ ($c_A^2 = H_0^2/4\pi\rho_0$) and is given by

$$\sqrt{\gamma}H_0' > \frac{\gamma-1}{\gamma}\frac{c_T^2}{c_A^2}\mathrm{Re}_T + \mathrm{Re}_T.$$

For the quasi-adiabatic approximation, $T_1/T_0 \sim \rho_1/\rho_0$, the stability criterion is given by

$$\frac{H_0'}{\mathrm{Re}_T} > \frac{1}{\gamma-1} \text{ и } \frac{H_0'}{\mathrm{Re}_T} < \frac{1}{\gamma-n(\gamma-1)}.$$

This indicates that instability arises from waves travelling against the flow as well as along the flow. Several examples are given to illustrate these points.

L 41509-65
ACCESSION NR: AP4044518

Orig. art. has: 46 equations and 3 figures.

ASSOCIATION: none

SUBMITTED: 13Jan64 ENCL: 00

SUB CODE: MM, GP NO REF SOV: 001 OTHER: 001

mcl
Card 3/3

L 10367-65 EWT(l)/EWG(k)/EWT(m)/EEC(t)/EWP(b) Pz-6 IJP(c)/AFWL/ASD(a)-5/
AS(mp)-2/FMDC/SSD/ESD(ge)/ESD(t)/RAEM(t) JD/AT

ACCESSION NR: AP4046641 S/0181/64/006/010/3161/3164

AUTHORS: Kalashnikov, S. G.; Morozov, A. I.; Kirillov, V. P. B

TITLE: Electrical oscillations at current saturation in cadmium sulfide

SOURCE: Fizika tverdogo tela, v. 6, no. 10, 1964, 3161-3164

TOPIC TAGS: cadmium sulfide, photoconductivity, Hall effect, carrier mobility, pulsed excitation

ABSTRACT: The authors investigated n-type crystals, 0.3--0.8 cm long, with a dark conductivity $<10^7$ ohm^{-1}.cm^{-1} and a Hall mobility ≈ 250 cm^2.V^{-1}.sec^{-1}. The electric field was directed either parallel or at right angles to the hexagonal c-axis. Persistent current oscillations were observed only at field intensities higher than a certain critical value E_{cr} [not specified] and only if the illumination of the crystal was nonuniform. The amplitude of the oscilla-

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L 10367-65

ACCESSION NR: AP4046641

tions reached 25% of the total current; the frequency was of the order of 1 Mc and it decreased with increase of the sample length. These persistent oscillations were observed only if the electric field was applied at right angles to the c-axis. Tests using pulsed voltages (of 20--1200 μsec duration) showed that the observed oscillations were not due to the response of the crystal to pulse excitation but appeared independently of such excitation in a certain range of field values. By varying the distribution of the illumination two different oscillation regions were found in the current-voltage characteristic. The oscillations were generated throughout the whole volume of the crystal. Additional uniform background illumination through a silicon filter ($\lambda > 1.1$ μ) quenched the oscillations while illumination through a germanium filter ($\lambda > 1.7$ μ) did not affect the oscillations. A magnetic field up to 1.3×10^4 Oe applied at right angles to the current did not greatly affect the oscillations. Cooling from room temperature to 100°K did not alter the general nature of the effect but somewhat increased (doubled)

Card 2/3

L 10367-65

ACCESSION NR: AP4046641

2

the oscillation frequency. "The authors thank L. A. Sy*soyev for supplying the crystals." Orig. art. has: 2 figures.

ASSOCIATION: Institut radiotekhniki i elektroniki AN SSSR, Moscow (Radio Engineering and Electronics Institute, AN SSSR)

SUBMITTED: 15May64 ENCL: 00

SUB CODE: SS, OP NR REF SOV: 000 OTHER: 005

Card 3/3

L 27901-65 EWT(1)/EPA(sp)-2/EWP(m)/EWA(d)/EWG(v)/T-2/EPA(w)-2/EPR/EWA(m)-2
Pd-1/Pab-10/Pe-5/Pa-4/Pi-4 IJP(c)
ACCESSION NR: AP4012080 S/0020/64/154/002/0306/0309 67

AUTHOR: Morozov, A. I.; Solov'yev, L. S. 8

TITLE: Symmetric flows of conducting fluid across a magnetic field

SOURCE: AN SSSR. Doklady*, v. 154, no. 2, 1964, 306-309

TOPIC TAGS: magnetic hydrodynamics, conducting fluid, compressed fluid, fluid flow, fluid mechanics, magnetohydrodynamics, axially symmetric fluid flow, magnetic field

ABSTRACT: A two-dimensional and axially-symmetric flow of a compressed conductive fluid was examined. Authors assumed for simplicity that fluid is nonviscuous and non-heat conducting. Then the stationary flow is described by the following magnetohydrodynamic equations:

$$(1)\quad \rho(\mathbf{v}\nabla)\mathbf{v} = -\nabla p + [\mathbf{j}\mathbf{H}],$$
$$(2)\quad \operatorname{div}\rho\mathbf{v} = 0, \quad \operatorname{div}\mathbf{H} = 0,$$
$$(3)\quad \operatorname{rot}\frac{\mathbf{v}}{\varepsilon} = 0, \quad \rho T\mathbf{v}\nabla S = \nu_m \mathbf{j}^2,$$

Card 1/3

where $\vec{\varepsilon} \equiv \frac{\sigma}{V 4\pi} E = v_m j - [vH] = \nabla\Phi$, $j \equiv \mathrm{rot}\, H$, $v_m = c^2/4\pi\sigma$, ρ = density; p=pressure; σ=conductivity; T=temperature; S=entropy; V=velocity; $B = \sqrt{4\pi}H$; H=magnetic field; E= electrical field. The following system of equations was then derived for the examined axially-symmetric flow:

$$\mathrm{div}\, q = 0, \quad q = \rho v\left(W + \frac{v^2}{2}\right) + [\vec{\varepsilon}H], \tag{4}$$

$$dW = \frac{dp}{\rho} + T\,dS. \tag{5}$$

$$\begin{pmatrix} \rho v_z \\ j_z \end{pmatrix} = \frac{1}{r}\frac{\partial}{\partial r}\begin{pmatrix} \psi \\ I \end{pmatrix}, \quad \begin{pmatrix} \rho v_r \\ j_r \end{pmatrix} = -\frac{1}{r}\frac{\partial}{\partial z}\begin{pmatrix} \psi \\ I \end{pmatrix}. \tag{6}$$

$$\frac{1}{\rho r}\frac{\partial}{\partial r}\frac{1}{\rho r}\frac{\partial\psi}{\partial r} + \frac{1}{\rho r}\left(\frac{\partial}{\partial z}\frac{1}{\rho r}\frac{\partial\psi}{\partial z} + I\Phi'(\psi) + T\frac{\nabla S\nabla\psi}{\rho^2 r^2 v^2} - U'(\psi) = 0, \tag{7a}$$

$$W + \frac{v^2}{2} + I\Phi'(\psi) = U(\psi), \tag{7б}$$

$$\frac{I}{\rho r^2} - v_m\frac{\nabla v\, I}{\rho r^2 v^2} = \Phi'(\psi), \tag{7в}$$

$$\rho T v\nabla S = \frac{v_m}{r^2}(\nabla I)^2. \tag{7г}$$

L 27901-65

ACCESSION NR: AP4012080

Two-dimensional flows in a narrow channel are described by the system:

$$\rho v f = \alpha = \text{const}, \quad (8)$$

$$\frac{H}{\rho} - \frac{v_m}{\rho a}\frac{dH}{ds} = \beta = \text{const}, \quad (9)$$

$$W + \frac{v^2}{2} + \beta H = U = \text{const}, \quad (10)$$

$$\rho v T \frac{dS}{ds} = v_m \left(\frac{dH}{ds}\right)^2. \quad (11)$$

Orig. art. has: 30 equations.

ASSOCIATION: None

SUBMITTED: 23Jul63 ENCL: 00

SUB CODE: NP,EM NO REF SOV: 003 OTHER: 000

Card 3/3

ACCESSION NR: AP4020569 S/0057/64/034/003/0429/0443

AUTHOR: Morozov, A.I.; Solov'yev, L.S.

TITLE: Axially symmetric steady flow of a plasma in an azimuthal magnetic field

SOURCE: Zhurnal tekhnicheskoy fiziki, v.34, no.3, 1964, 429-443

TOPIC TAGS: plasma, plasma flow, plasma xxxxxx accelerator, adiabatic plasma flow, magnetohydrodynamics, steady magneto hydrodynamic flow

ABSTRACT: The steady isentropic flow in the annular space between two coaxial surfaces of revolution of a perfectly conducting compressible fluid in the presence of an azimuthal magnetic field is discussed in some detail. The calculations were undertaken because of possible applications to plasma acceleration. The magnetohydrodynamic equations are specialized to the case of isentropic flow with axial symmetry in which the radial and longitudinal components of the magnetic field and the azimuthal component of the velocity vanish. The resulting equations are discussed in two limiting cases: 1) the width of the annular channel is small compared with its radius, although both the width and the radius may be functions of the longitudinal coordinate z; 2) all quantities are slowly varying functions of z. In case 1)

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ACCESSION NR: AP4020569

it is possible to solve the problem for arbitrary channel shape. The solutions in which either the hydrodynamic or the magnetic pressure is small compared with the other are discussed in more detail. It is found that under some conditions the current may reverse and the magnetic field may act locally to decelerate the fluid. In case 2) the simplified equations are still nonlinear. Their solution is formulated as a Cauchy problem: one boundary of the channel is specified, together with the flow rate along it, and the other boundary is obtained as part of the solution. A number of solutions are obtained for the two limiting cases of a cold plasma, and of "isomagnetic flow" (the magnetic field proportional to the product of the fluid density and the distance from the axis). The shape of the "critical surface" on which the flow velocity is equal to the velocity of magneto-acoustic waves is discussed. Orig.art.has: 94 formulas and 5 figures.

ASSOCIATION: none

SUBMITTED: 01Mar63 DATE ACQ: 31Mar64 ENCL: 00

SUB CODE: PH NR REF SOV: 004 OTHER: 001

Card 2/2

ACCESSION NR: AP4041988 S/0057/64/034/007/1141/1153

AUTHOR: Morozov, A.I.; Solov'yev, L.S.

TITLE: Plane flow of a perfectly conducting compressible fluid with the Hall effect taken into account

SOURCE: Zhurnal tekhnicheskoy fiziki, v.34, no.7, 1964, 1141-1153

TOPIC TAGS: plasma, magnetohydrodynamics, Hall effect, plane parallel stream, steady flow

ABSTRACT: The magnetohydrodynamics equations for the steady flow of a perfectly conducting plasma are modified to take account of the Hall effect, and some consequences of the modified equations are derived. The modification of the magnetohydrodynamic equations consists in replacing the usual equation $\mathrm{rot}[\mathbf{v}, \mathbf{H}]=0$ by

$$\mathbf{E}+\frac{1}{c}[\mathbf{v}, \mathbf{H}]-\frac{1}{enc}[\mathbf{j}, \mathbf{H}]=0,$$

and introducing the equation

$$\mathbf{v}_e=\mathbf{v}-\frac{\mathbf{j}}{en},$$

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ACCESSION NR: AP4041988

for the current j. Here v_e is the electron velocity and v is the ion velocity. In the remaining magnetohydrodynamic equations the velocity is assumed to be that of the ions; thus, the electron pressure and the inertial forces of the electrons are neglected. Two stream functions are introduced (one for the ions and one for the electrons), and the conservation laws are derived. The plane flow in a channel bounded by cylindrical walls of arbitrary shape is discussed in some detail, and solutions are obtained for a narrow channel and for a channel with slowly varying section. The walls of the channel are regarded as electrodes through which current enters and leaves the plasma; the flow is thus of the type that occurs in a magnetohydrodynamic accelerator or pump. In such a system the Hall emf at the wall of the channel is tangent to the wall; the conductive wall will thus short circuit the Hall emf and a peculiar Hall-effect boundary layer will develop. This boundary layer is not discussed in detail. It is assumed that the boundary layer can be avoided by employing slotted electrodes. Orig.art.has: 98 formulas and 4 figures.

ASSOCIATION: none

SUBMITTED: 25Jun63 ATD PRESS: 3082 ENCL: 00

SUB CODE: ME,EM NR REF SOV: 002 OTHER:000

Card 2/2

L 6638-65 EWT(1)/EWP(m)/EWG(k)/EPA(sp)-2/EWG(v)/EPR/EPA(w)-2/EEC(t)/T-2/EEC(b)-2/EWA(m)-2 Pz-6/Po-4/Pd-4/Pab-24/Pe-5/Pa-4/Pi-4 LJP(c)/RAEM(a)/BSD/AEDC(a)/ESD(ga)/RAEM(c)/AFWL/SSD/ASD(a)-5/AFETR/ASD(d)/ASD(f)-2/AEDC(b)/ASD(p)-3/ESD(t) WW/AT

ACCESSION NR: AP4041989 S/0057/64/034/007/1154/1169

AUTHOR: Morozov, A. I.; Solov'yev, L. S. 21 B

TITLE: Acceleration of a rotating plasma in axially symmetric channels

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 34, no. 7, 1964, 1154-1169

TOPIC TAGS: plasma, magnetohydrodynamics, plasma acceleration, plasma rotation

ABSTRACT: In this paper, earlier theoretical work of the authors (DAN SSSR, 149, 3, 1963; ZhTF 34, 3, 429, 1964) concerning the magnetohydrodynamic acceleration of a perfectly conducting plasma in an axially symmetric channel of annular cross section is extended to include rotation of a plasma and the presence of a longitudinal magnetic field. The magnetohydrodynamic equations are taken from the earlier work in a form suitable for axially symmetric calculations, and their integrals are discussed. The flow in narrow axially symmetric channels is then discussed. The flow in narrow axially symmetric channels is then discussed in detail. After the general integrals and the appropriate form of the Hugoniot equation are derived, flow with infinitely small initial velocity is discussed separately for the two cases that the radius of plasma (of infinitesimal but variable

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L 8638-65
ACCESSION NR: AP4041989

section) is or is not constant. The velocity of flow cannot pass continuously through the local signal velocity; the three possible types of continuous flow (flow velocity always greater than, equal to, or less than the local signal velocity) are discussed separately. In the final section the authors treat the flow of a cold plasma in a channel which need not be narrow, but in which the radii of the walls are slowly varying functions of the axial coordinate. Orig. art. has: 98 formulas and 6 figures.

ASSOCIATION: none

SUBMITTED: 18Jul63 ENCL: 00 SUB CODE: MC, EM

NO REF SOV: 005 OTHER: 000

Card 2/2

L 15062-65 EWT(d)/EWT(1)/EWG(k)/EPA(sp)-2/EEC-4/EPA(w)-2/EEC(t)/T/EEC(b)-2/
EED-2/EWA(m)-2/EWP(1) Pg-4/Pi-4/Pk-4/Po-4/Pq-4/Pz-6/Pab-10 IJP(c)/AFWL/SSD(b)/
ASD(a)-5/AEDC(b)/SSD/BSD/ASD(p)-3/AFETR/TAEM(a)/ESD(gs)/ESD(t) GG/AT/BB
S/0057/64/034/009/1566/1575

ACCESSION NR: AP4045265

AUTHOR: Morozov, A. I.; Solov'yev, L. S. 6

TITLE: Cybernetic control of plasma instabilities 14

SOURCE: Zhurnal tekhnicheskoy fiziki, v.34, no.9, 1964, 1566-1575

TOPIC TAGS: plasma instability, plasma stability, cybernetic system

ABSTRACT: It is proposed to suppress the development of certain instabilities in a plasma by injecting currents or applying local corrective magnetic fields of strengths and at locations determined by the developing instability itself. The proposal is illustrated by a discussion of the flute instability of a plasma cylinder confined in a magnetic field between magnetic mirrors. A number of probes would be disposed azimuthally about the plasma cylinder. Should an excrescence begin to develop, the nearest probe would sense this and the signal from this probe would cause application of an additional magnetic field at the appropriate position, thereby increasing the local magnetic pressure and driving the excrescence back into the body of the plasma. Alternatively, the signal from the probe could cause an azimuthal current to be injected into the plasma through electrodes on either side of the ex-

1/2

ACCESSION NR: AP4046265

crescence. It is estimated that for a 2 m long 60 cm diameter deuterium plasma cylinder in a 10^4 Oe magnetic field, having a particle density of 10^{12} cm^{-3} and thermal velocities of 10^8 cm/sec, corrective currents of the order of 30 A or corrective magnetic fields of the order of 50 Oe would be required. The nature of the feedback required to achieve stability is discussed in some detail for the simply Taylor instability of a plasma layer in magnetic and gravitational fields and for several instabilities of plasma cylinders, including constrictions, the helical instability in the presence of a longitudinal current, and the flute instability of a rotating filament. It is concluded that stability can be achieved in all these cases, but that the feedback signal must provide information concerning not only the present magnitude of the developing instability, but also concerning its rate of growth.

"The authors express their gratitude to Academicians L.A.Artsimovich and M.A.Leontovich for their interest in the present work, and also to M.S.Ioffe, Ye.I.Dobrokhotov and N.N.Semashko for valuable discussions."Orig.art.has: 56 formulas and 7 figures.

ASSOCIATION: none

SUBMITTED: 13Nov63 ENCL: 00

SUB CODE: ME NR REF SOV: 005 OTHER: 001

ACCESSION NR: AP4019240 S/0056/64/046/002/0710/0718

AUTHORS: Morozov, A. I.; Shubin, A. P.

TITLE: On the theory of electromagnetic effects in the presence of the Hall effect

SOURCE: Zhurnal eksper. i teor. fiz., v. 46, no. 2, 1964, 710-718

TOPIC TAGS: Hall effect, semiconductor, solid conductor, stationary electro-magnetic process, quasistationary electromagnetic process, equilibrium current configuration, equilibrium field configuration, oscillating current structure, damping length, skin effect

ABSTRACT: In view of the fact that the manifestations of the Hall effect in a plasma are made complicated by many factors, the authors analyze the specific role of the Hall effect, using as an example a homogeneous solid medium with constant carrier conductivity and concentration. Both stationary and quasistationary electromagnetic

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ACCESSION NR: AP4019240

processes in the medium are considered. The cases include direct current (planar and axially-symmetrical flow), nonlinear quasistationary fields, and plane linear waves in the presence of direct current in the medium. It is found that: (1) Only equilibrium field and current configurations can exist for a long time in a medium with a strongly pronounced Hall effect and high conductivity. (2) If the geometry of the conductor with strongly pronounced Hall effect and high conductivity does not permit the formation of an equilibrium configuration, then the current flowing in the conductor oscillates strongly over the cross section. The possibility that the current is nonstationary cannot be excluded. (3) The damping length of the electromagnetic waves can greatly differ from the ordinary skin-layer thickness. The larger the conductivity of the medium, the larger the damping length. The wave then propagates through the medium with a velocity on the order of the carrier velocity (or carrier effective velocity). "The authors are grateful to L. S. Solov'yev for interest in the work and for remarks."

Card 2/3

ACCESSION NR: AP4019240

Orig. art. has: 48 formulas and 6 figures.

ASSOCIATION: None

SUBMITTED: 18Jul63	DATE ACQ: 27Mar64	ENCL: 00
SUB CODE: PH	NO REF SOV: 003	OTHER: 007

Card 3/3

MOROZOV, A.I.; SOLOV'YEV, L.S.

Symmetric flow of a conducting fluid across a magnetic field. Dokl. AN SSSR 154 no.2:306-309 Ja'64. (MIRA 17:2)

1. Predstavleno akademikom L.A. Artsimovichem.

L 12916-65 EWT(1)/EWG(k)/EPA(sp)-2/EPA(w)-2/EEC(t)/T/EEC(b)-2/EWA(m)-2 Pz-6/Po-4/
Pab-10/Pi-4 IJP(c)/AEDC(b)/AFWL/AFETR/ASD(a)-5/ASD(p)-3/SSD/RAEM(a)/ESD(gs)/ESD(t)/
ACCESSION NR: AP4047322 SSD(b) AT S/0020/64/158/004/0831/0834

AUTHORS: Morozov, A. I.; Solov'yev, L. S.

TITLE: Equilibrium of plasma pinch with helical perturbations

SOURCE: AN SSSR. Doklady*, v. 158, no. 4, 1964, 831-834

TOPIC TAGS: plasma pinch, plasma instability, plasma containment

ABSTRACT: It is shown that the appearance of singularities in the linearized equations for perturbations of toroidal plasma configurations is connected with a qualitative rearrangement of the structure of the magnetic surfaces, and that arbitrarily small static perturbations can lead to finite changes in plasma configurations and thus noticeably affect their stability. The configurations considered are: 1. Cylindrical magnetic surfaces with helical perturbations. 2. Equilibrium helical plasma configurations. 3. Force-free plasma configuration. The first case results in a wavy mag-

Card 1/2

netic-surface structure with the elliptic and hyperbolic singular points lying on circles. In the second case it is shown that, depending on the choice of the initial equilibrium configuration, the development of instability reduces to the formation of a stable filamentary plasma structure. In the case of a force-free plasma configuration it becomes possible to obtain the stability conditions for a plasma supported by an ideally conducting liner. This report was presented by M. A. Leontovich. Orig. art. has: 6 formulas and 1 figure.

ASSOCIATION: None

SUBMITTED: 14Apr64 ENCL: 00

SUB CODE: ME NR REF SOV: 007 OTHER: 001

L 60334-65 EWT(1) IJP(c)

ACCESSION NR: AP5018294 UR/0057/65/035/007/1189/1192

538.122

AUTHOR: Grayev, M.I.; Mikhaylova, M.S.; Morozov, A.I. 23 21 B

TITLE: On the structure of unsymmetric toroidal magnetic fields 21

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 35, no. 7, 1965, 1189-1192

TOPIC TAGS: magnetic field, toroidal field, helical magnetic field, perturbation

ABSTRACT: In a series of earlier papers (ZhTF, 31, No. 10, 1961; DAN SSSR, 143, No. 1, 1962; Ibid., 148, No. 6, 1963; Ibid., 153, No. 4, 1963) the authors and collaborators have discussed the structure of a three-turn helical magnetic field perturbed by a corrugated field. Further results of these calculations are reported in the present paper, but the calculations themselves are not presented and only one of them is described, and that only very briefly. The fields discussed are those derived from the scalar potential $V = z + 3l_3(3r)\sin 3(\varphi - z) + h_0 I_0(3r)\sin 3z$, where r, φ, z are cylindrical coordinates and h_0 is a parameter. The fields were treated as toroidal by identifying the points r, φ, z and $r, \varphi, z + 2\pi/3$. The behavior of the magnetic lines of force was characterized by their successive intersection points with the plane $z = 0$. The separatrix of this field is very involved, and the authors speak of an S-region rather than of the separatrix itself.

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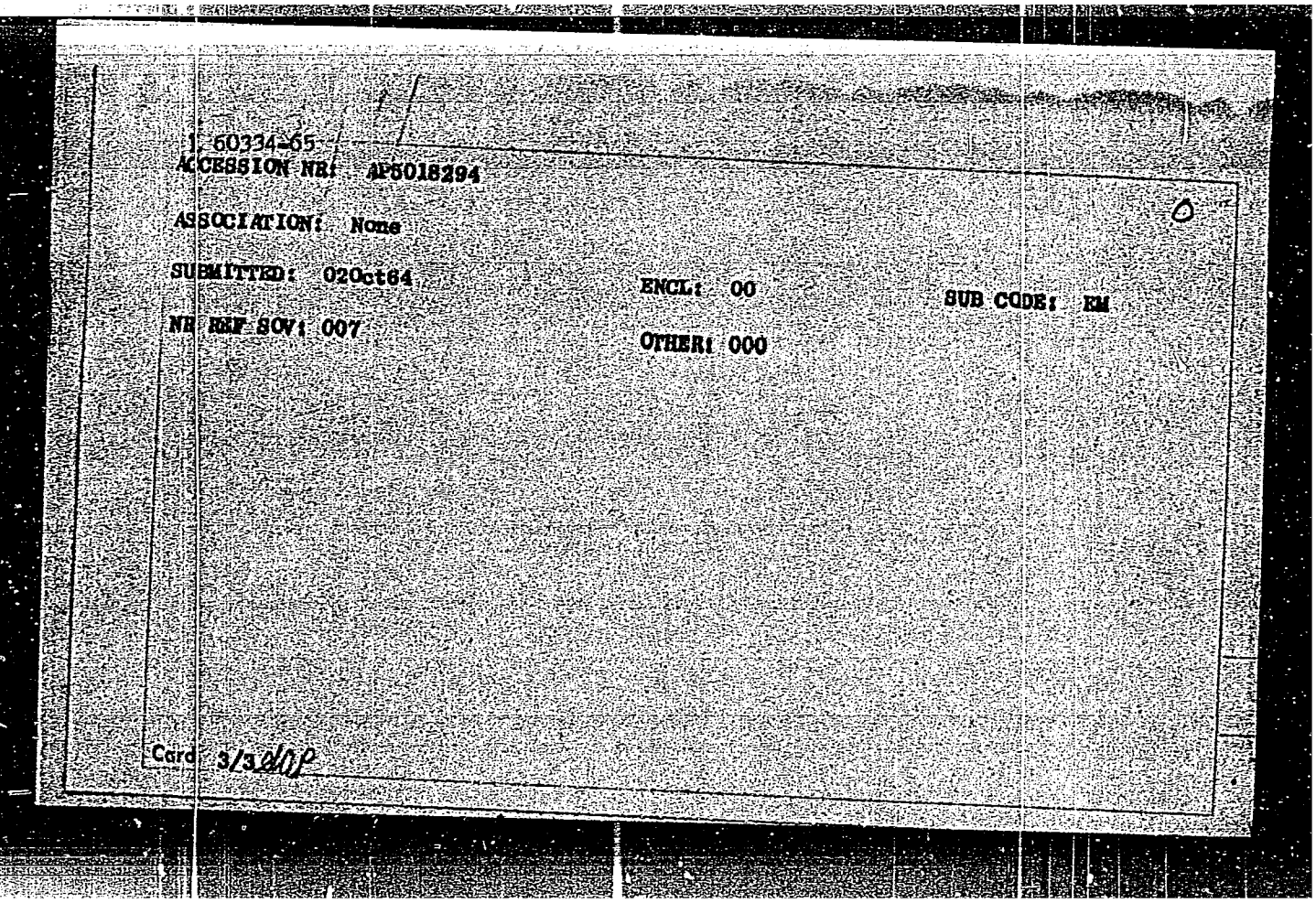
L 60334-65
ACCESSION NR: AP5018294

There are two S-regions, of which the inner one has the form of three petals or loops. The results reported in the present paper pertain to the region between the inner and outer S-regions outside the loops. The image points of points on the negative x-axis ($\varphi = \pi$) were determined and the displacement function $\delta(x)$ and the function $\varphi_N(x)$ were calculated. These functions are defined in the references cited above but not in the present paper. The function $\delta(x)$ is presented graphically. The following conclusions are adduced: 1) The amplitude of $\delta(x)$ is not monotonic but has a minimum at $x = -0.022$. 2) There are regions on the negative x-axis at which $\delta(x)$ behaves as though it were tending to infinity. 3) The rational points (i.e., those at which $\delta(x)$ vanishes) correspond to periodic solutions with the period $2\pi N/3$. 4) For $h_0 = 0.125$ all the rational points outside the petals are hyperbolic; for $h_0 = 0.120$ there were found two elliptic points on the negative x-axis. The authors have devised a method for calculating the separatrix which is simpler than that of V.K.Mel'nikov (DAN SSSR, 148, No.6, 1963); they describe this method very briefly and present graphically a portion of the separatrix for $h_0 = 0.125$ which they have calculated by means of it. "The authors are grateful to V.I.Arnol'd and V.K.Mel'nikov for discussing matters touched upon in this paper." Orig. art. has: 3 formulas and 3 figures.

Card 2/3



L 60334-65
ACCESSION NR: AP5018294

ASSOCIATION: None

SUBMITTED: 02Oct64 ENCL: 00 SUB CODE: EM

NR REF SOV: 007 OTHER: 000

Card 3/3 pdp

BRUSHLINSKIY, K.V. (Moskva); ZUYEVA, N.M. (Moskva); MOROZOV, A.I. (Moskva)

Establishment of a quasi-one-dimensional plasma flow in a shaped channel. Izv. AN SSSR. Mekh. no.5:3-6 S-O '65. (MIRA 18:10)

MOROZOV, A.I.; SOLOV'YEV, L.S.

Magnetic mirror trap with a uniformly increasing field. Atom. energ. 19 no.5:420-423 N '65. (MIRA 18:12)

L 11890-66 EWT(1)/EWT(m)/EPF(n)-2/EWP(t)/EWP(b)/ETC(m) IJP(c) JD/WW

ACC NR: AP5028014 SOURCE CODE: UR/0386/65/002/008/0362/0365

44 55

AUTHOR: Morozov, A. I.

ORG: Institute of Radio Engineering and Electronics, Academy of Sciences SSSR (Institut radiotekhniki i elektroniki Akademii nauk SSSR)

TITLE: Even acousto-electric effect in zinc sulfide crystals

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu (Prilozheniye), v. 2, no. 8, 1965, 362-365

TOPIC TAGS: zinc sulfide, acoustoelectric effect, sound propagation

ABSTRACT: The author reports that he observed an even acousto-electric effect in a zince-sulfide crystal, in which a longitudinal sound wave propagates in the direction of the hexagonal axis C. The experimental setup used to investigate the evenness of the acousto-electric effect (Fig. 1) consisted of two X-cut quartz converters, simultaneous operation of which gave rise to a standing-wave mode, and sequential operation to a mode of waves traveling in opposite directions. The measurements were made under pulsed operation at 25 Mc. Photosensitive samples of zinc sulfide, whose conductivity was varied by the additional illumination from a mercury lamp, were investigated. Comparison tests with a CdS crystal show that in CdS the acousto-electric pulse voltage reverses polarity with change in wave direction--the effect is odd--whereas in ZnS there is no reversal and the effect is even. The magnitude of the even effect, like that of the odd effect, increased linearly with the sound intensity. At ~250 v on the converter, the average acousto-electric field exceeded 5 v/cm for a 0.5 Meg load.

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L 11890-66

ACC NR: AP5028014

The even acousto-electric effect always had a definite polarity, regardless of the surface finish of the sample and of the nature of the contacts. Positive voltage always corresponded to the $(000\bar{1})$ plane, and negative to (0001). Crystals in which an even acousto-electric effect was observed displayed strong luminescence under the influence of the mercury-lamp radiation. Since the even acousto-electric effect, unlike the odd one, can be of diverse nature, its physical causes call for further explanation. Author is grateful to Professor S. G. Kalashnikov for discussion and interest in the work, to I. I. Kisil' for supplying the crystals, and to M. A. Zemlyanitsin for help with the measurements. Orig. art. has: 2 figures.

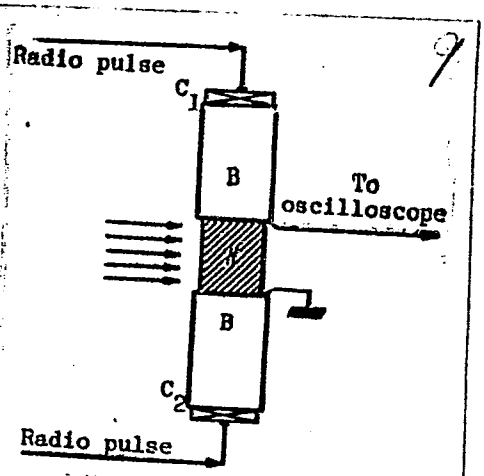

Fig. 1. Diagram of setup used to observe the acousto-electric effect.

SUB CODE: 20/ SUBM DATE: 04Aug65/ ORIG REF: 003/ OTH REF: 003

PC

Card 2/2

L 11906-66 EWT(1)/ETC(F)/EPF(n)-2/EWG(m) IJP(c) AT
ACC NR: AP6001905 UR/0294/65/003/006/0827/0837

AUTHOR: Morozov, A.I. (Moscow); Shubin, A. P. (Moscow)

ORG: None

TITLE: Flow of a plasma between electrodes with weak longitudinal conductivity

SOURCE: Teplofizika vysokikh temperatur, v.3, no.6, 1965, 827-837

TOPIC TAGS: heat conductivity, magnetic field, Hall effect, electric field, electrode

ABSTRACT: The article considers the steady-state nonviscous plane flow of a highly conducting plasma in a narrow channel under the effect of a transverse magnetic field and in the presence of the Hall effect. The presence of the Hall effect leads to the appearance of a component of the electric field directed along the flow. In the calculations, the walls of the channel are considered to be the electrodes between which the flow passes. If the electrodes are divided into infinitely thin layers, no condition is posed for E_t on the surface of the electrodes. If the electrodes are metallic and are not divided into layers, the following condition must be satisfied on their surface:

Card 1/2 UDC: 538.4

L 11906-66

ACC NR: AP6001905

3

$$E_t = 0. \qquad (1.1)$$

Calculation of flow with the above boundary condition leads to great difficulties, since it is a question of the solution of a non-linear two-dimensional problem. Therefore, in this article, the case is simplified by assuming that although the electrodes are divided into layers, there is short-circuiting across sufficiently large resistances between sections. "In conclusion, we wish to thank V.I. Tokatl' for fruitful discussion of questions touching on the work." Orig. art. has: 80 formulas and 3 figures.

SUB CODE: 20/ SUBM DATE: 03Jul64/ ORIG REF: 001/ OTH REF: 001

80

Card 2/2

L 26111-65 EWT(1)/EWG(k)/EEC(t) Pz-6 IJP(c) AT

ACCESSION NR: AP5003470 S/0181/65/007/001/0324/0326

32
15
B

AUTHOR: Morozov, A. I.

TITLE: Dependence of the coefficient of ultrasound absorption in cadmium sulfide crystals on the illumination 21

SOURCE: Fizika tverdogo tela, v. 7, no. 1, 1965, 324-326

TOPIC TAGS: cadmium sulfide, ultrasound absorption, absorption coefficient, photoconductivity

ABSTRACT: Although theoretical analyses of the propagation of ultrasound in piezoelectric crystals have been published by several authors, no detailed comparisons of the experimental data with the theory have been made. The authors therefore measured the absorption of ultrasound in photoconducting CdS crystals, using the apparatus shown in Fig. 1 of the Enclosure. To restrict the investigation to the electronic part of the absorption, relative measurements of the

Card 1/3

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ACCESSION NR: AP5003470

absorption were made as functions of the change in the crystal conductivity. The crystal investigated had a large dark specific resistivity (>2 x 10^8 ohm-cm), so that absorption in darkness could be assumed to be zero. The crystal was illuminated uniformly with light in a narrow spectral region around 5780 Å. The intensity of the light was varied by means of grids, without changing the spectral composition. The sample conductivity was measured by a null method. Both the plot of the absorption against the conductivity and calculations of the frequency dependence of the absorption at the maximum point showed very good agreement with the theory of A. R. Hudson and D. L. White (J. Appl. Phys. v. 33, 40, 1962) or V. L. Gurevich (FTT v. 4, 909, 1962). "In conclusion the author thanks Professor S. G. Kalashnikov for interest and valuable advice, and also L. A. Sysoyev for supplying the CdS crystals and M. A. Zemlyanitsyn for help with the measurements." Orig. art. has: 2 figures, 1 table, and 1 formula. [02]

L 26111-65

ACCESSION NR: AP5003470

ASSOCIATION: Institut radiotekhniki i elektroniki AN SSSR, Moscow (Institute of Radio Engineering and Electronics, AN SSSR)

SUBMITTED: 30Jul64 ENCL: 01 SUB CODE: SS, GP

NO REF SOV: 001 OTHER: 003 ATD PRESS: 3186

Card 3/4

L 6336l-65 EEC(b)-2/EWT(l)/EWT(m)/EWP(b)/T/EWP(t) Pl-4 IJP(c) GG/JD

ACCESSION NR: AP5017324 UR/0181/65/007/007/2215/2217

AUTHOR: Kalashnikov, S. G.; Morozov, A. I.; Stankovskiy, B. A.; Sysoyev, L. A.

TITLE: Effect of spectral composition of applied field on the amplification of ultrasound in cadmium sulfide

SOURCE: Fizika tverdogo tela, v. 7, no. 7, 1965, 2215-2217

TOPIC TAGS: cadmium sulfide, ultrasound amplification, photosensitive crystal

ABSTRACT: The authors investigate the amplification of ultrasound in photosensitive crystals of cadmium sulfide at frequencies 25, 30, and 75 Mcs. The purpose of the work was to check experimentally some theoretical results reported by D. L. White (J. Appl. Phys. v. 33, 2547, 1962) and to ascertain whether the observed amplification can be increased. The experimental procedure was analogous to that described by A. R. Hutson et al (Phys. Rev. Lett. v. 7, 237, 1961). The crystals were obtained from the melts under pressure by a method described by the authors earlier (FTT v. 4, 807, 1962). On the whole, plots of the attainable gain against the applied electric field agreed qualitatively with the thoery, the maximum gain at 75 Mcs amounting to 102 dB/cm. However, the absolute maximum gain or absorption of power, obtained for different crystals having the same electric conductivity, differed. In some crystals, the maximum gain was also greatly dependent on the spec-

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L 63344-65

ACCESSION NR: AP5017324

tral composition of the applied illumination. An analysis of the results shows that the differences in the maximum gain obtained in the different crystals are due to the difference in the concentrations of various traps in the crystal. It is concluded that for some crystals it is possible to increase greatly the gain of the ultrasound by suitably choosing the spectral composition of the pumping light. For example, the power gain at 25 Mcs could be amplified 100-fold with practically no change in the electric conductivity. Orig. art. has: 1 figure, 3 formulas, and 1 table. [02]

ASSOCIATION: Institut radiotekhniki i elektroniki AN SSSR, Moscow (Institute of Radio Engineering and Electronics, AN SSSR)

SUBMITTED: 10Feb65 ENCL: 00 SUB CODE: SS, GP

NO REF SOV: 002 OTHER: 006 ATD PRESS: 4056

Card 2/2

L 4118-66 EWT(1)/T IJP(c) GG

ACCESSION NR: AP5025388 UR/0181/65/007/010/3070/3078

AUTHOR: Morozov, A. I. 44,55

TITLE: Investigation of the acoustoelectric effect in cadmium sulfide crystals

SOURCE: Fizika tverdogo tela, v. 7, no. 10, 1965, 3070-3078

TOPIC TAGS: acoustoelectric effect, cadmium sulfide, semiconductor crystal, electric conductivity, photosensitivity

ABSTRACT: The acoustoelectric effect is studied as a function of conductivity in CdS *n*-type crystals with dark resistivities of 10^6 to 10^{10} Ω·cm and high photosensitivity. Radio pulses were applied to a piezoelectric transducer and the resultant ultrasonic pulse was isolated from the transducer by a quartz buffer and passed through the CdS test specimen. A block diagram of the experimental set-up is given in the paper. The conductivity of the specimen was changed by varying the illumination incident on its surface. Comparison of experimental and theoretical curves for the average acoustoelectric field as a function of conductivity shows satisfactory agreement on the whole. The acoustoelectric field was also studied as a function of the amplitude and duration of the radio pulses applied to the transducer. It was

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L 4118-66

ACCESSION NR: AP5025388

found that the acoustoelectric field is proportional to the pulse duration for short pulses. The acoustoelectric field ceases to increase when the ratio of the length of the specimen to the velocity of sound is equal to the pulse duration. The magnitude of the acoustoelectric field was found to be proportional to the square of the r-f pulse voltage within a wide range of voltages. The maximum acoustoelectric field strength was limited by the voltage of the r-f pulse applied to the transducer. This maximum value was 150 $v \cdot cm^{-1}$. The acoustoelectric field was greater for crystals having a high coefficient of absorption at the maximum of the curve for conductivity as a function of ultrasonic absorption per unit of length. The acoustoelectric effect was found to be strongly dependent on the spectral content of the light used to illuminate the specimen. The experimental data are used to check the feasibility of Weinreich's relation:

$$E_{ae} = \frac{\lambda Q \alpha_e}{nev_s},$$

where E_{ae} is the average acoustoelectric field, λ is a numerical factor which depends on the mechanism of conduction electron scattering, Q is the intensity of the sonic stream, α_e is the sonic attenuation factor associated with interaction between the ultrasonic wave and conduction electrons, n is the electron concentration, e is

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L 4118-66

ACCESSION NR: AP5025388

15

the charge on the electron, and v_s is the velocity of sound. It is found that the data conclusively prove the feasibility of this relation. "In conclusion, the author is grateful to S. G. Kalashnikov for interest in the work and valuable consultation during discussion of the results, to V. G. Alekseyeva for useful advice, and also to L. A. Sysoyev for providing perfect crystals of cadmium sulfide, and to M. A. Zemlyanitsin for assistance with the measurements." Orig. art. has: 5 figures, 7 formulas, 1 table. [14]

ASSOCIATION: Institut radiotekhniki i elektroniki AN SSSR, Moscow (Institute of Radio Engineering and Electronics, AN SSSR)

SUBMITTED: 17May65 ENCL: 00 SUB CODE: SS, GP

NO REF SOV: 007 OTHER: 011 ATD PRESS: 4127

Card 3/3

L 11431-66 EWT(1) GG/LHB
ACCESSION NR: AP5021886 UR/0020/65/163/006/1363/1366

AUTHOR: Morozov, A. I. 44,55

45 B

TITLE: Focusing cold quasineutral beams in electromagnetic fields 21,99,25

SOURCE: AN SSSR. Doklady, v. 163, no. 6, 1965, 1363-1366

TOPIC TAGS: ion beam, electromagnetic field, ion beam focus, space charge distribution

ABSTRACT: The feasibility of charge compensated ion beam focusing is discussed analytically. Conditions are given which would insure the existence of an electric field to compensate the ion beam space charge. These conditions are:

$$kT_e/eU \ll 1$$
$$j/\sigma \ll E$$
$$v_e \lesssim v_i,$$

which reduces the momentum equation for the cold electrons to the equation

$$\mathbf{E} + \frac{\mu}{\sigma}[\mathbf{v}_e, \mathbf{H}] = 0$$

which in turn insures the presence of an electric field perpendicular to both the electron drift velocity and the magnetic field. In particular, an annular geometry

Card 1/2

is selected to obtain a closed azimuthal electron drift. This leads to a magnetic field $\psi = rA_\theta(r, z) = \text{const}$

and equipotential lines $\varphi = \varphi(\psi)$

which satisfy the requirement of space charge compensation for the ion beams. As a special case an external magnetic field is considered whose lines of force coincide with equipotential lines leading to the following condition for space charge neutralization $\varphi = E_0 a \ln \frac{\rho}{a}, \quad A_z = -H_0 a \ln \frac{\rho}{a}.$

and the following focusing plane is obtained for the ion beam

$$\theta_* = \frac{\pi}{\sqrt{2 + (\omega_H/0)^2}}$$

(θ is the azimuthal angle). Orig. art. has: 15 formulas and 3 figures.

ASSOCIATION: none

SUBMITTED: 31Dec64 ENCL: 00 SUB CODE: NP, EM

NO REF SOV: 004 OTHER: 001

Card 2/2

L 5225-66 EWT(1)/ETC/EPF(n)-2/EWG(m)/EPA(w)-2 IJP(c) AT
ACC NR: AP5026924 SOURCE CODE: UR/0373/65/000/005/0003/0006

AUTHORS: Brushlinskiy, K. V. (Moscow); Zuyeva, N. M. (Moscow); Morozov, A. I. (Moscow)

ORG: none

TITLE: Establishment of quasi-one-dimensional flow of plasma in variable cross section channels

SOURCE: AN SSSR. Izvestiya. Mekhanika, no. 5, 1965, 3-6

TOPIC TAGS: plasma flow, MHD, magnetic pressure, perfect gas, supersonic flow, electric conductivity

ABSTRACT: The problem of stationary flow establishment in a variable cross section, planar channel (see Fig. 1) with plasma as the working fluid is studied theoreti-

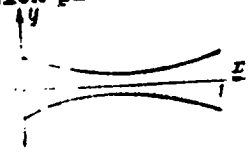

Fig. 1

Card 1/3

cally. The magnetic field is applied in the z-direction, and the plasma is assumed to obey the perfect gas law. The time-dependent, inviscid flow equations are given as functions of the x-coordinate only along with the magnetic induction equation. The following three boundary conditions are satisfied

$$\rho = 1, \quad p = 0.3, \quad s = 0, \quad H = H_2 = H_0/H_1 \quad \text{at} \quad x = 0,$$

together with the initial conditions

$$\rho = 1, \; s = 0, \; v = 0 \text{ at } t = 0.$$

The equations are solved numerically for $t \geq 0$, $0 \leq x \leq 1$ with the following additional condition in the supersonic regime of the flow $\partial (Hf) / \partial x = 0$ at $x = 1$. The channel cross section was varied according to the law $f(x) = 0.3 - 0.8x(1 - x)$, and the solution was obtained for three values of H, the magnetic field, and two laws of electric conductivity as a function of the temperature. The stationary-flow state is found to depend inversely on the velocity and directly on the electric conductivity σ. For large values of σ the flow is established very quickly. The authors thank M. G. D'yakonikhina for carrying out the numerical computations in this work. Orig. art. has: 16 equations and 4 figures.
44,55

L 5225-66
ACC NR: AP5026924

SUB CODE: GP, ME/ SUBM DATE: 090ct64/ ORIG REF: 002/

Card 3/3 mR

L 13954-66 EWT(1)/ETC(F)/EPF(n)-2/EWG(m) IJP(c) DM/AT

ACC NR: AP6001691 SOURCE CODE: UR/0089/65/019/005/0420/0423

AUTHOR: Morozov, A. I.; Solov'yev, L. S.

ORG: none

TITLE: Magnetic mirror trap with a field increasing in all directions

SOURCE: Atomnaya energiya, v. 19, no. 5, 1965, 420-423

TOPIC TAGS: magnetic mirror machine, magnetic trap, axial magnetic field

ABSTRACT: The authors investigage the topography of the stationary point of the square of a magnetic field. It is shown that only saddle points of B^2 may exist along the axis of an axisymmetric field; minima of B^2 cannot be found in a plane field; a minimum of B^2 cannot be found in an axisymmetric field in a point which is not on the axis if the field direction in that point coincides with the symmetry axis z. Consequently, axisymmetric traps with minimum field region can be designed by using an azimuthal field as a basis (e.g., in conjunction with a superposed quadrupole field) or a basic radial field such as proposed by J. Andreoletti (C. r. Acad. sci., Paris, 256, 1969, (1963)). Since such a field has a very simple configuration, the authors study the properties of such Andreoletti fields the field strength lines of which become concentrated when approaching the z axis. Several possible solutions are proposed for magnetic mirror traps with special pole pieces or appropriate surface currents. Orig. art. has: 26 formulas and 3 figures. UDC: 533.9

Card 1/1 SUB CODE: 20/ SUBM DATE: 28Jan65/ ORIG REF: 002/ OTH REF: 003

L 17605-66 EWT(1) IJP(c) AT

ACC NR: AP6002719 SOURCE CODE: UR/0056/65/049/006/1789/1795

AUTHORS: Bryzgalov, V. I.; Morozov, A. I.

ORG: Institute of Mathematics im. V. A. Steklov, Academy of Sciences SSSR (Institut matematiki Akademii nauk SSSR)

TITLE: Stationary flow of current in an axially-symmetrical conductor with strong Hall effect

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 49, no. 6, 1965, 1789-1795

TOPIC TAGS: Hall effect, galvanomagnetic effect, plasma diffusion, plasma instability, semiconductor conductivity

ABSTRACT: This is a continuation of earlier work by one of the authors (Morozov, with A. P. Shubin, ZhETF v. 46, 710, 1964) dealing with some electromagnetic effects in slightly deformed conducting media in the presence of a strong Hall field. The solution for the current-distribution equation obtained in the earlier paper in general form are discussed in the present paper for simple concrete geometries,

Card 1/2

L 17605-66
ACC NR: AP6002719

namely a full or hollow corrugated axially symmetrical conductor. The earlier equations are rewritten in dimensionless form to facilitate the numerical calculations. It is shown that in a corrugated conducting body the current is crowded out of the corrugations in the presence of a strong Hall effect, and that in a hollow body made up of intersecting corrugations, such that the height of the corrugation exceeds the thickness, the current flows in a thin-layer which skirts the walls. The distribution of the current in such a layer is calculated. It is shown that the results can be applied to a hot corrugated plasma cylinder, where the elimination of the current from the corrugations will slow down the development of plasma distortion and also affect the diffusion of plasma in a magnetic field. Another application is to semiconductors, which cannot carry heavy current unless an external magnetic field is applied. Orig. art. has: 6 figures and 40 formulas.

SUB CODE: 20/ SUBM DATE: 21Apr65/ ORIG REF: 002/

Card 2/2 nst

L 3376-66 EWT(1)/ETC/EPF(n)-2/EWG(m)/EPA(w)-2 IJP(c) AT

ACCESSION NR: AP5023363 UR/0020/65/164/001/0080/0083

44,55

AUTHORS: Morozov, A. I.; Solov'yev, L. S. 44,55

71
B

TITLE: A similarity parameter in theory of plasma flows 21, 44, 55

SOURCE: AN SSSR. Doklady, v. 164, no. 1, 1965, 80-83

TOPIC TAGS: similarity analysis, plasma flow, compressible flow, magnetic field, entropy, Hall effect

ABSTRACT: A similarity analysis is made of a two-fluid, fully ionized plasma flow under steady state conditions. A vector potential is defined for ions and electrons

$$n_e v_e = \operatorname{rot} \vec{\Psi}_e, \quad n_i v_i = \operatorname{rot} \vec{\Psi}_i.$$

which, when combined with Maxwell's equation, yields

$$H = \frac{4\pi e}{c}(\vec{\Psi}_i - \vec{\Psi}_e) + H_0.$$

The similarity parameter for the flow is defined by

$$\xi = \frac{c|H - H_0|_{\text{charact}}}{4\pi |\vec{\Psi}_i|_{\text{charact}}}.$$

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L 3376-66

ACCESSION NR: AP5023363

For the case of a flow in a coaxial channel of arbitrary cross section ξ becomes

$$\xi = \left| \frac{\dot{N}_e - \dot{N}_i}{\dot{N}_i} \right| = \frac{I_p}{I_a}.$$

Because of the fact that ψ is a three-dimensional vector, one can construct three ξ parameters. In the absence of dissipation terms and for $m_e/M \to 0$, the magnetic field degenerates into an electron component where one can show that ξ takes on the physical meaning of a "charge exchange" parameter. Orig. art. has: 16 equations and 3 figures.

ASSOCIATION: none

SUBMITTED: 05Jan65 ENCL: 00 SUB CODE: [illegible] ME

NO REF SOV: 003 OTHER: 001

Card 2/2

L 32178-66 EWT(1) IJP(c) AT
ACC NR: AP6013920 SOURCE CODE: UR/0207/66/000/002/0030/0035

AUTHOR: Morozov, A. I. (Moscow)

ORG: none

TITLE: Theory of the supersonic part of a nondissipative box type accelerator

SOURCE: Zhurnal prikladnoy mekhaniki i tekhnicheskoy fiziki, no. 2, 1966, 30-35

TOPIC TAGS: plasma accelerator, ion acceleration, electric field, [redacted]

ABSTRACT: The author develops a theory for the supersonic part of a box type accelerator. Calculations are given for two-dimensional flow of a two-component cold nondissipative plasma. Only low density plasma acceleration is studied, where the density of the plasma is ($n \gtrsim 10^{14}$ cm^{-3}). Three conditions must be considered in setting up a low density box type accelerator: 1. sectional electrodes must be used; 2. conditions must be maintained to prevent interaction between the fast particle stream and the wall; 3. conditions have to be maintained insuring the escape of the plasma from the magnetic field. It is shown that nondissipative plasma escapes from a magnetic field under the condition $\xi \gg 1$, where the exchange parameter ξ is the ratio of the discharge current I_0 to the intensity of ion flux I_i at the accelerator output

$$\xi = I_0 / I_i, \quad I_i = eq/m.$$

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L 32178-66
ACC NR: AP6013920 3

where q is the mass flow of the working medium. The author thanks A. I. Bugrova, L. Ye. Kalihman, and L. S. Solov'yev for their helpful discussions. Orig. art. has: 3 figures, 23 formulas.

SUB CODE: 20/ SUBM DATE: 07Jun65/ ORIG REF: 009/ OTH REF: 001

Card 2/2 mc

L 29861-66 EWT(l)/EWP(m)/ETC(f) IJP(c) AT

ACC NR: AP6013229 SOURCE CODE: UR/0421/66/000/002/0189/0192 84 83

AUTHOR: Brushlinskiy, K. V. (Moscow); Gerlakh, N. I. (Moscow); Morozov, A. I. (Moscow)

ORG: none

TITLE: Two-dimensional steady state flow of a good conducting plasma in a coaxial system

SOURCE: AN SSSR. Izvestiya. Mekhanika zhidkosti i gaza, no. 2, 1966, 189-192

TOPIC TAGS: plasma conductivity, gas flow, magnetic field

ABSTRACT: The article considers a two dimensional geometry of the channel. To simplify the calculations, dissipation effects in the plasma are not taken into account. The problem of two dimensional flow is solved in the article by direct numerical calculation in systems with different geometries of the electrons. The following assumptions are made: 1) the system is axially symmetrical; 2) flow of the plasma is isentropic; 3) constant density and pressure are maintained at the inlet of the channel; 4) the total current flowing through the system is kept constant, and the magnetic field at the inlet is distributed according

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L 29861-66

ACC NR: AP6013229

to the law H = const/r; 5) the plasma is non-viscous, non-heat conducting, and Joule heating is absent; 6) the conductivity of the plasma is assumed to be finite, but sufficiently high so that the magnetic Reynolds number is very much greater than unity. "In conclusion the authors thank O. V. Lokutsiyevskiy for his many discussions of this work while it was being carried out." Orig. art. has: 1 formula and 4 figures.

SUB CODE: 20/ SUBM DATE: 090ct64/ ORIG REF: 001.

Card 2/2 FV

L 33619-66 EWT(1) AT
ACC NR: AP6015320 (A, N) SOURCE CODE: UR/0057/66/036/005/0960/0962

AUTHOR: Lebedev, S. V.; Morozov, A. I.

ORG: none

TITLE: Focusing of an ion beam in the field of a charged current-carrying ring

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 36, no. 5, 1966, 960-962

TOPIC TAGS: electron optics, electric field, magnetic field, space charge, ionized plasma

ABSTRACT: From a general argument based on previous theoretical work of A.I.Morozov (DAN SSSR, 164, No. 6, 1363, 1965) on electric and magnetic fields in plasmas, the authors conclude that any focusing system containing both electric and magnetic fields will focus a low density beam with uncompensated space charge differently than it will focus a high density beam with compensated space charge (plasma). This conclusion is illustrated by calculation of the focal length of a charged current-carrying ring under the two conditions. The calculations are performed in the thin lens approximation, i.e., it is assumed that the focal length is much larger than the radius of the ring. It is found that in the case of a low density beam with uncompensated space charge the paraxial focal length is always positive, whereas in the case of a high density beam the focal length can have either sign. The difference between the focal

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L 33419-66
ACC NR: AP6015320

lengths in the two cases is due to redistribution of the electric field as a result of the space charge induced in the high density space charge compensated beam. The expression derived for the induced space charge density is independent of the density of the beam. This means that if the density of the space charge compensated beam exceeds a certain value, further increase of the density will not lead to further change in the focal length. Orig. art. has: 11 formulas and 2 figures.

SUB CODE: 20/ SUBM DATE: 05Jun65/ ORIG REF: 002/ OTH REF: 000

Card 2/2 UR

ACC NR: AP7003024 SOURCE CODE: UR/0109/66/011/005/0954/0958

AUTHOR: Proklov, V. V. Kreynin, O. L; Morozov, A. I.; Bondarenko, V. S.

ORG: none

TITLE: Ultrasonic convertiers based on the CdS depletion layer [This paper presented at All-union conference on new directions of research in the field of absorption, reinforcement, generation and reception of sonic and ultrasonic vibrations in solid bodies and utilization of these effects in acoustics and radiotechnology held in Moscow from 22 to 23 June 1965]

SOURCE: Radiotekhnika i elektronika, v. 11, no. 5, 1966, 954-958

TOPIC TAGS: thin film circuit, frequency characteristic

ABSTRACT: In an investigation of cadmium sulphide ultrasonic transducers with depletion layers, analysis was made of the effect of transducer geometry and resistivity on the smoothness of the amplitude-frequency characteristic, the insertion loss, and the bandwidth.

N-type single-crystal thin CdS films with a normal resistivity of 0.5—2 ohm·cm were used. MV—000 copper was vacuum deposited (10^{-5} mm Hg) on the working surface. The copper was allowed to

UDC: 534.232.45-8

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diffuse into the surface of the CdS films under a constant temperature of 400° C. The diffusion time was changed in the range from 2 to 30 minutes, depending on the required transducer center frequency (5—100 Mc).

The test setup consisted of a pulse generator modulating an rf source with 1—10 μsec pulses. The rf signal was applied to 1) an attenuator in tandem with an hf amplifier, detector, and oscilloscope, and 2) an LC impedance matching unit followed by the CdS transducer being tested and the associated delay medium. The scope display in each case consisted of two pulses: 1) an input pulse to the CdS transducer, and 2) a pulse which was converted to an ultrasonic signal delayed and reflected in the delay medium (fused quartz glass 8 cm long), and converted back to electrical rf energy. The distance between two consecutive pulses was equal to the round-trip delay through the medium, and the height of two pulses supplied information on transducer losses.

The figure shows test results of typical transducers: one with crystal faces parallel to each other, the other with one side slanted. In the first (curve 1), a 6 x 6 x 1.5 mm transducer was tested in

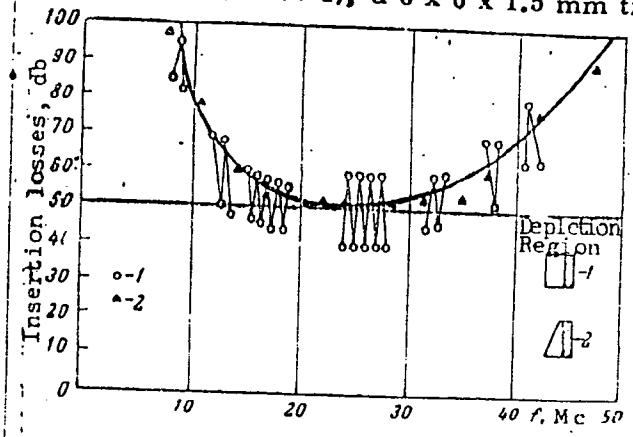

Fig. 1. Amplitude-frequency characteristics of a transverse mode CdS-25 transducer, thickness d = 0.15 cm

1 - Parallel working faces; 2 - slanted working faces.

the transverse mode at a fundamental frequency of 26 Mc. The ripple, whose period was 580 kc, corresponded to the ultrasonic wave round-trip transit time through the CdS material. Curve 2 was smooth but

had a minimum insertion loss 12 db greater than in the first case. This curve was obtained by slanting one surface of the CdS material or by utilizing a fully absorbing matched load for the transducer.

To investigate the effect of base material resistivity on the transducer operation, longitudinal mode transducers with 10^{-3} ohm-cm material were tested. The amplitude-frequency plot of such a transducer (parallelepiped shaped) exhibited a 5 Mc period ripple (2.5 Mc had been expected). This is explained by the fact that the whole crystal acts as a half-wave ultrasonic converter (its thickness in this case was 0.87 mm). The minimum insertion loss was 26 db at 23 Mc. The use of matched absorbing loads did not alleviate the situation.

The table, which shows representative test results of CdS transducers with depletion layers, indicates that ultrasonic delay lines with considerable bandwidth and insertion losses of the order of 50 db are realizable. Trade-off between bandwidth and insertion loss is possible

ACC NR: AP7003024

Table 1. Test results for CdS transducers with depleted layers

Mode	Electromechanical coupling constant	Ratio between acoustic resistivity of transducer and delay medium	Fundamental transducer frequency, Mc	Band-pass, %	Total losses in double conversion and propagation through fused quartz glass 8 cm long db
Transverse	0.188	1.005	16	40	53
			38	53	65
			75	15	50
			25	12*	34*
Longitudinal	0.262	1.64	22.8	34	53
			40	30	45

* Data when fixed narrowband tuning was utilized.

The authors thank S. G. Kalashnikov for his interest in this work.

Orig. art. has: 4 figures and 1 table. (FSB: v. 2, no. 7)

SUB CODE: 09 / SUBM DATE: 19Jul65 / ORIG REF: 001 / OTH REF: 008

Card 5/5

MOROZOV, A.Kh.

Our methods for reducing yarn breakage. Tekst. prom. 20 no. 11:57-59 N '60. (MIRA 13:12)

1. Zamestitel' glavnogo inzhenera Furmanovskoy fabriki No. 1.
(Textile machinery)

MOROZOV, A.Kh.

Automatic conveying of yarn. Mekh.i avtom.proizv. 15 no.9:55-57 S '61. (MIRA 14:11)

1. Zamestitel' glavnogo inzhenera Furmanovskoy pryadil'no-tkatskoy fabriki No.1 Ivanovskogo sovnarkhoza.
(Ivanovo--Textile industry--Equipment and supplies)
(Electric controllers)

MOROZOV, A.Kh.

From practices of the automation of production. Tekst.prom. 21 no.5:49-50 My '61. (MIRA 15:1)

1. Zamestitel' glavnogo inzhenera Furmanovskoy pryadil'no-tkatskoy fabriki No.1.
(Textile industry) (Assembly-line methods)

MOROZOV, A. L.

"Data on the Problem of the Functional Condition of the Digestive Glands in Certain Diseases (Anemia, Ulcers, Toxic Conditions, Silicosis)." Dr Med Sci, Acad Med Sci USSR, Moscow, 1953. (RZhBiol, No 8, Dec 54)

Survey of Scientific and Technic..l Dissertations Defended at USSR Higher Educational Institutions (12)

SO: Sum. No. 556 24 Jun 55

MOROZOV, A.I., kandidat meditsinskikh nauk.

Present-day status of the clinical aspects, pathogenesis and therapy of silicosis. Bor'ba s sil. 1:199-212 '53. (MLRA 7:10)

1. Institut gigiyeny truda i profzabolevaniy Akademii meditsinskikh nauk SSSR.
(LUNGS--DUST DISEASES)

LETAVET, A.A.; RYAZANOV, V.A.; KHOTSYANOV, L.K.; MOROZOV, A.L.; MARTSINKOVSKIY, B.I.; MITEREV, G.A.; IVANOV, V.A.; IZRAEL'SON, Z.I.; ORLOV, N.I.; CHERKINSKIY, S.N.; BERYUSHOV, K.G.; KIBAL'CHICH, I.A.; TARASENKO, N.Yu.; DRAGICHINA, Ye.A.; VORONTSOVA, Ye.I.; SANINA, Yu.P.; KREMNEVA, S.N.; KULAGINA, N.K.; SHAFRANOVA, A.S.; TIKHAYA, M.G.; MOLOKANOV, K.P.; RAZUMOV, N.P.; KURLYANDSKAYA, E.B.; KHALIZOVA, O.D.

In memory of Professor N.S.Pravdin. Gig.i san. no.4:61 Ap '54. (MLRA 7:4)

(Pravdin, Nikolai Sergeevich,)

SOSNOVIK, I.Ya., doktor meditsinskikh nauk; MOROZOV, A.I., doktor meditsinskikh nauk; MOLOKANOV, K.P., doktor meditsinskikh nauk; YEVGENOVA, M.V., kandidat meditsinskikh nauk; ZENIN, I.I., nauchnyy sotrudnik

The use of tissue therapy for patients with silicosis. Bor'ba s sil. 2:378-381 '55. (MLRA 9:5)

1. Institut gigiyeny truda i profzabolevaniy Akademii meditsinskikh nauk SSSR.
(LUNGS--DUST DISEASES)

LETABET, A.A., professor, otvetstvennyy redaktor; PRIOROV, N.N., professor, redaktor; KHOTSYANOV, L.K., professor, redaktor; GNILORYBOV, T.Ye., professor, redaktor; DVIZHKOV, P.P., professor, redaktor; MOROZOV, A.L., doktor meditsinskikh nauk, redaktor; MOLOKANOV, K.P., doktor meditsinskikh nauk, redaktor; MALYSHEVA, A.Ye., kandidat meditsinskikh nauk, redaktor; CHERNIKOV, A.P., redaktor; GLUKHOVSKOVA, G.A., tekhnicheskiy redaktor;

[Work hygiene, sick rate and prevention of accidents in the metallurgical and mining industry] Gigiena truda, zabolevaemost' i profilaktika travmatizma v metallurgicheskoi i gornorudnoi promyshlennosti. Moskva, Gos. izd-vo med. lit-ry, 1956. 230 p. (MLRA 10:1)

1. Akademiya meditsinskikh nauk SSSR, Moskva. 2. Deystvitel'nyy chlen AMN SSSR (for Letavet) 3. Chlen-korrespondent AMN SSSR (for Priorov, Khotsyanov)

(TRAUMATISM) (LUNGS—DUST DISEASES)

MOROZOV, A. L.

Principles of judging working ability in occupational diseases.
Nepegeszsegugy 37 no.7:169-175 July 56.

1. Professzor (Szovjetunio Orvostudomanyi Akademiajanak Munkaegeszsegugyi es Foglalkozasi Betegsegek Intezete).
(INDUSTRIAL HYGIENE
working ability determ. after occup. dis. (Hun))

DVIZHKOV, P.P.; YEVGENOVA, M.V.; MOLOKANOV, K.P.; MOROZOV, A.L.; MARTSINKOVSKIY, B.I. [deceased]; EL'YASHEV, L.I. (Moskva)

Classification of pneumoconiosis. Gig.truda i prof.zab. 1 no.3: 3-7 My-Je '57. (MIRA 11:1)

1. Institut gigiyeny truda i professional'nykh zabolevaniy AMN SSSR.
(LUNGS--DUST DISEASES)

DROGICHINA, E.A. (Moskva); MOROZOV, A.L. (Moskva); RASHEVSKAYA, A.M. (Moskva)

Professional pathology in the U.S.S.R. Gig.truda i prof.zab. 1 no.5: 41-45 S-O '57. (MIRA 10:11)

1. Institut gigiyeny truda i profzabolevaniy AMN SSSR i Kafedra profpatologii TSentral'nogo instituta usovershenstvovaniya vrachey
(OCCUPATIONAL DISEASES)

MOROZOV, A.L., professor

First all-Union conference on problems of disability evaluation in occupational diseases. Sov.med. 21 no.2:133-139 F '57. (MLRA 10:6)

1. Iz Instituta gigiyeny truda i professional'nykh zabolevaniy (dir. - deystvitel'nyy chlen Akademii meditsinskikh nauk SSSR prof. A.A.Letavet) Akademii meditsinskikh nauk SSSR.
(OCCUPATIONAL DISEASES) (DISABILITY EVALUATION)

MOROZOV, A.L., prof.

Function of the main digestive glands in silicosis and silico-tuberculosis. Bor'ba s sil. 4:16-19 '59. (MIRA 12:11)

1. Institut gigiyeny truda i profzabolevaniy AMN SSSR.
(LUNGS--DUST DISEASES)
(DIGESTION)

MOROZOV, A.L., prof. (Moskva)

Current status and prospects for clinical studies of pneumoconioses in U.S.S.R. Klin.med. 38 no.10:5-7 O '60. (MIRA 13:11)

(LUNGS—DUST DISEASES)

MOLOKANOV, K.P.; MOROZOV, A.L.; RASHEVSKAYA, A.M.; KRAPUKHINA, Ye.P.; ORLOVA, A.A.; STEPANOVA, V.I.; SHALYA, N.G.

Clinical, diagnostic, and therapeutic aspects of berylliosis. Sov.med. 25 no.4:22-30 Ap '61. (MIRA 14:6)

1. Iz Instituta gigiyeny truda i profzabolevaniy (dir. - deystvitel'nyy chlen AMN SSSR A.A.Letavet) AMN SSSR.
(BERYLLIUM—TOXICOLOGY)

MOROZOV, A.M.

14696* (Russian.) Operating Martin Furnaces With Auxiliary Air Feed Through the Gas Opening. Rabota martenovskikh pechei s podachei dopolnitel'nogo vozdukha v gazovyi prolet. S. N. Bystrov, A. A. Dobrokhotov, and A. M. Morozov. *Stal'*, v. 16, no. 7, June 1956, p. 597-601.

Introducing an auxiliary supply of air through the gas opening increased output by 5 to 7% and reduced the amount of fuel used.

SHASKOL'SKIY, B.V., kand. tekhn. nauk; SOTNIKOVA, K.F., inzh.; GAVRILIN, Ye.F.; LUBKOV, A.N.; SAPOZHNIKOV, V.M.; ZHUCHENKO, L.F.; CHIGIRINA, N.I., tekhnik; ZHARIKOV, I.P., inzh.; CHERTISHCHEVA, A.Ye.; SHAPOVALOV, V.K., tekhnik; MOROZOV, A.M., inzh.; SLIVKO, S.V., tekhnik; CHERNAVSKIY, G.N., kand. tekhn. nauk; STRUZHESTRAKH, Ye.I., inzh., ed.; EL'KIND, V.D., tekhn. red.; DEMKINA, N.F., tekhn. red.

[General norms for time and machining conditions used in the industry for machining on automatic lathes; mass, large-lot and lot production]Obshchemashinostroitel'nye normativy vremeni i rezhimov rezaniia na tokarno-avtomatnye raboty; massovoe, krupnoseriinoe i seriinoe proizvodstvo. Moskva, Mashgiz, 1962. 271 p. (MIRA 15:12)

1. Moscow. Tsentral'noye byuro promyshlennykh normativov po trudu. (Turning--Production standards)

ZHURAVLEV, V.V., inzhener; MOROZOV, A.M., inzhener.

Floating diesel electric power station. Mekh.stroi. 14 no.3:29 Mr '57. (MLRA 10:4)

(Diesel electric power plants)

MOROZOV, A.M.

SUBJECT USSR / PHYSICS
AUTHOR LEJPUNSKIJ,O.I., MILLER,V.V., MOROZOV,A.M.,JAMPOL'SKIJ,P.A.
TITLE The Isomers with Short Period obtained by Proton Bombardment.
PERIODICAL Dokl.Akad.Nauk, 109, fasc.5, 935-937 (1956)
Issued: 10 / 1956 reviewed: 11 / 1956

The present work forms part of the general program of research concerning the discovery of short-lived isomers created on the occasion of nuclear reactions. Here the nuclei were excited by an impulselike bundle of 20 MeV protons. The targets of substances to be examined were located in a vacuum at an angle of 45^{o} with respect to the bundle. Short-period γ -radiation occurring as a result of proton bombardment was recorded by means of a scintillation counter and β-radiation was recorded by means of a counter with a stilb-crystal. The impulses of the counters were amplified and discriminated by means of an integral amplitude analyzer, after which they impinged upon the screen of a special cathode oscillograph with "standing" development, and were then photographed.
On the occasion of the irradiation of Be a noticeable β-activity was noticed with $T_{1/2}=0,85 \pm 0,15$ sec. This activity may be ascribed to the Li^{8}($T_{1/2}=0,87\pm0,02$ sec) created on the occasion of the reaction $Be^{9}(p,2p)Li^{8}$. The threshold of this reaction computed from the masses is 18,7 MeV. In the course of further tests new γ -activities, which had formerly not been noticed, were found, which belong to hitherto unknown isotopes. The characteristics of these γ -activities are shown in a table. Apart from half lives, the estimated yields of these γ -activities are given. The elements concerned are Ti, Cd, Ta, Tl, Pb, Bi. Also on the occasion

Morozov, A M

AUTHOR: LEYPUNSKIY,O.I., MOROZOV,A.M., MAKAROV,YU.V. PA - 2705
YAMPOL'SKIY,P.A.

TITLE: New Short-Lived Isomeres within the Millisecond Domain.
(Novyye korotkoperiodnyye izomery v millisekundnoy oblasti, Russian)

PERIODICAL: Zhurnal Eksperim. i Teoret.Fiziki, 1957, Vol 32, Nr 2,
pp 393-394 (U.S.S.R.)
Received: 5 / 1957 Reviewed: 7 / 1957

ABSTRACT: The authors investigated such isomeric states as occur on the occasion of reactions with 20 MeV protons. Data on new isomeric activities of some elements were determined recently. The method used for the investigation of these short-lived activities were described in a previous work (O.I.LEYPUNSKIY et al., Doklady Akademii Nauk, 1956, Vol 109, Nr 935). In the case of the measurements described here the energy of γ-radiation was determined by means of a photomultiplier FEU-19 with NaJ(Tl) crystals and a one-channelled differential discriminator. Also the control tests are mentioned.
A table contains the half-value periods found here and the values of the energy of γ-radiation of the newly discovered activities. The half-value periods found on the occasion of control tests with different compounds of the same element agree well among

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New Short-Lived Isomeres within the Millisecond Domain. PA - 2705

one another. The data found here are compared with those found by other authors shortly after the here discussed measurements had been carried out. (1 Table).

ASSOCIATION: Chemical-Physical Institute of the Academy of Science of the U.S.S.R.

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Card 2/2

21(1) SOV/56-36-3-60/71

AUTHORS: Morozov, A. M., Yampol'skiy, P. A.

TITLE: The New Short-period Isomers As^{75m} and Ga^{70m} Obtained in Reactions With Fast Protons (Novyye korotkoperiodnyye izomery As^{75m} i Ga^{70m}, poluchayushchiyesya pri reaktsiyakh s bystrymi protonami)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 36, Nr 3, pp 950 - 951 (USSR)

ABSTRACT: In the present "Letter to the Editor" the authors give a report on experimental investigations of short-lived isotopes obtained by reactions with fast protons. By irradiation of germanium with fast protons the authors found an activity with $T_{1/2}$ = 17.5±2.0 msec at E_γ = 0.31 Mev, which was ascribed to the As^{75m} according to the reaction $Ge^{76}(p,2n)As^{75m}$. (As to experiments cf. references 1,6,7,8). As a proton source the authors used the linear accelerator of the FTI AN USSR (Physico-Technical Institute of the AS UkrSSR). Exact determinations resulted in E= 0.30±0.01 Mev and

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$T_{1/2}$= 16±1 msec for As^{75m}. Also in the case of an irradiation of arsenic targets with fast protons an intense radiation with E_γ= 0.29±0.01 and $T_{1/2}$= 16± 1 Mev was found, with a threshold of the reaction amounting to ~ 13 Mev. According to reference 5 this is in agreement with the values (E_γ=0.305 Mev, $T_{1/2}$= 17 msec; E2-transition, 402 level) for As^{75m} and is ascribed to the reaction $As^{75}(p,p')As^{75m}$. Also in the case of a bombardment of gallium targets with fast protons the authors found a short-lived γ-radiation (E_γ=0.19±0.01 Mev, $T_{1/2}$=19±1 msec); a bombardment of germanium with 14 Mev neutrons lead to a radiation with E_γ = 0.17±0.01 Mev, $T_{1/2}$= 16± 1 msec. These activities may be ascribed to the reactions $Ge^{70}(n,p)Ga^{70m}$ (E3-transition) and $Ga^{71}(p,pn)Ga^{70m}$ (cf. Ref 9). The authors finally thank O. I. Leypunskiy for his assistance and collaboration, Yu. V. Makarov for discussions, N. M. Meleshin and O. B. Likin for their assistance, and further also K. D. Sinel'nikov,

The New Short-period Isomers As^{75m} and Ga^{70m} Obtained in Reactions With Fast Protons SOV/56-36-3-60/71

A. K. Val'ter, A. P. Klyucharev and A. M. Smirnov for taking part in this work. There are 11 references, 6 of which are Soviet.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute for Chemical Physics of the Academy of Sciences, USSR)

SUBMITTED: November 27, 1958

Card 3/3

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TITLE: Five New Millisecond Isomers [illegible]roduced in Nuclear Reactions With 19.2-Mev Protons 79

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TEXT: The present work is the continuation of research made into the short-period isomers produced by fast proton reactions. The authors describe the control of the beam intensity, the establishment of the radiation of short-period isomer, and the determination of the energy and half-life of the radiation by means of an apparatus schematically described in Fig. 1. The source of the 19.2-Mev protons was the linear accelerator of the FTI AN USSR (Institute of Physics and Technology of the AS UkrSSR). The identification of the isotope is explained to whose nuclear reaction the isomer level is to be ascribed. Moreover, the identification of the type of reaction which leads to the formation of

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